UNIVERSITAS
GADJAH MADA
Kajian Pendahuluan Induksi Obesitas pada Tikus Rattus norvegicus (Berkenhout, 1769) Betina Galur Wistar Menggunakan Cafeteria Diet
Rima Arvisya Natania Putri, Dr. Laksmindra Fitria, S.Si., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

DAFTAR PUSTAKA

Ajayi, A. F., & Akhigbe, R. E. (2020). Staging of the estrous cycle and induction of estrus in experimental rodents: an update. *Fertility Research and Practice* 6:5. https://doi.org/10.1186/s40738-020-00074-3.

Amir, M. N., Aulia, R., Suardi, H., Hatifah, Z. A., Ismail, I., Raihan, M., & Evary, Y. M. (2023). Studi *In vivo* ekstrak etanol kulit buah nangka (*Artocarpus heterophyllus* L.) sebagai kandidat obat analgetik terhadap model hewan uji mencit (*Mus musculus*). *Jurnal Mandala Pharmacon Indonesia*, *9*(1), 139–147. https://doi.org/10.35311/jmpi.v9i1.338.

Arneth, B. (2024). Mechanisms of insulin resistance in patients with obesity. *Endocrines*, *5*(2), 153–165. https://doi.org/10.3390/endocrines5020011.

Avery, D., Morandini, L., Sheakley, L., Alajmi, A., Bergey, L., Donahue, H. J., Martin, R. K., & Olivares-Navarrete, R. (2024). Obesity prolongs pro-inflammatory responses and impairs bone healing in titanium implants. *Acta Biomaterialia*, 192, 473–486. https://doi.org/10.1016/j.actbio.2024.11.040.

Bansal, S., Vachher, M., Arora, T., Kumar, B., & Burman, A. (2023). Viseral fat: A key mediator of NAFLD development and progression. *Hepatology and Nutrition Medicine*. https://doi.org/10.1016/j.hnm.2023.200210.

Baskara, S. C., Nasrulloh, N., & Marjan, A. Q. (2024). Pengaruh *food bar* berbasis daun katuk dan daun torbangun pada profil toksisitas tikus putih. *Amerta Nutrition*, *8*(3SP), 336–343. https://doi.org/10.20473/amnt.v8i3sp.2024.336-343.

Bortolin, R. C., Vargas, A. R., Gasparotto, J., Chaves, P. R., Schnorr, C. E., Martinello, K. D. B., Silveira, A. K., Rabelo, T. K., Gelain, D. P., & Moreira, J. C. F. (2018). A new animal diet based on human Western diet is a robust diet-induced obesity model: comparison to high-fat and cafeteria diets in terms of metabolic and gut microbiota disruption. *International Journal of Obesity, 42*, 525–534. https://doi.org/10.1038/ijo.2017.225

Busebee, B., Ghusn, W., Cifuentes, L., & Acosta, A. (2023). Obesity: a review of pathophysiology and classification. *Mayo Clinic Proceedings* 98(12):1842–1857. https://doi.org/10.1016/j.mayocp.2023.05.026.

Cora, M. C., Kooistra, L., & Travlos, G. S. (2015). Vaginal cytology of the laboratory rat and mouse: review and criteria for the staging of the estrous cycle using stained vaginal smears. *Toxicologic*

UNIVERSITAS
GADJAH MADA
Kajian Pendahuluan Induksi Obesitas pada Tikus Rattus norvegicus (Berkenhout, 1769) Betina Galur Wistar Menggunakan Cafeteria Diet
Rima Arvisya Natania Putri, Dr. Laksmindra Fitria, S.Si., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Pathology, 43(6), 776–793. https://doi.org/10.1177/0192623315570339.

Czech, M. P. (2017). Insulin action and resistance in obesity and type 2 diabetes. *Nature Medicine*, 23(7), 804–814. https://doi.org/10.1038/nm.4350.

DeFronzo, R. A. (2009). From the triumvirate to the ominous octet: a new paradigm for the treatment of type 2 diabetes mellitus. *Diabetes*, 58(4), 773–795. https://doi.org/10.2337/db09-9028.

Dekrismar, O. P. K., Gaina, C. D., & Amalo, F. A. (2022). Literature study of histological structure of female pig reproduction system. *Jurnal Veteriner Nusantara*, 5(2), 54–67. https://doi.org/10.35508/jvn.v5i2.4579.

Dias, M. M. M. E., Reis, S. A. D., Conceição, L. L. D., Sediyama, C. M. N. D. O., Pereira, S. S., Oliveira, L. L. D., Peluzio, M. D. C. G., Martinez, J. A., & Milagro, F. I. (2021). *Diet-induced obesity in animal models: Points to consider and influence on metabolic markers*. Diabetology & Metabolic Syndrome, 13(1), 32. https://doi.org/10.1186/s13098-021-00647-2.

Elías-Lopez, A. L., Vázquez-Mena, O., & Sferruzzi-Perri, A. N. (2022). Mitochondrial dysfunction in the offspring of obese mothers and its transmission through damaged oocyte mitochondria: Integration of mechanisms. *Frontiers in Cell and Developmental Biology*, 10, 869343. https://doi.org/10.3389/fcell.2022.869343.

Fatsecret. (n.d.). *Makanan dan Merek di Indonesia*. Fatsecret. Retrieved April 10, 2026, from https://www.fatsecret.co.id/kalori-gizi

Feješ, A., Sušienková, P., Mihalovičová, L., Kunšteková, V., Gurecká, R., Borbélyová, V., Celec, P., & Šebeková, K. (2025). Cafeteria and fast-food diets induce neuroinflammation, social deficits, but a different cardiometabolic phenotype. *Nutrients*, *17*(22), 3614. https://doi.org/10.3390/nu17223614.

Felici, M., & Klinger, F. G. (2021). The PI3K/PTEN/AKT signaling pathway in germ cell development and its involvement in germ cell tumors and ovarian dysfunction. *International Journal of Molecular Sciences,* *22*(18), 9838. https://doi.org/10.3390/ijms22189838.

Flessa, C.-M., Nasiri-Ansari, N., Kyrou, I., Leca, B.M., Lianou, M., Chatzigeorgiou, A., Kaltsas, G., Kassi, E., & Randeva, H.S. (2022). Genetic and diet-induced animal models for non-alcoholic fatty liver disease (NAFLD) research. *International Journal of Molecular Sciences*, 23(24), 15791. https://doi.org/10.3390/ijms232415791.

UNIVERSITAS
GADJAH MADA
Kajian Pendahuluan Induksi Obesitas pada Tikus Rattus norvegicus (Berkenhout, 1769) Betina Galur Wistar Menggunakan Cafeteria Diet
Rima Arvisya Natania Putri, Dr. Laksmindra Fitria, S.Si., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Franssen, J. A. M. A., Suryani, H. P. F., & Fentener van Vlissingen, J. M. (1994). Food and water intake. In: *Handbook of Laboratory Animal Science*. Vol. 1. Amsterdam: Elsevier. pp. 241–248. https://doi.org/10.1016/B978-044481871-3.50019-9.

Gao, X., Li, Y., Ma, Z., Jing, J., Zhang, Z., Liu, Y., & Ding, Z. (2021). Obesity induces morphological and functional changes in female reproductive system through NF-κB and MAPK signaling in mice. *Reproductive Biology and Endocrinology, 19*, 148. https://doi.org/10.1186/s12958-021-00833-x.

Gijsen, H. S. & Kotzé-Hörstmann, L. (2023). Rat models of diet-induced obesity and metabolic dysregulation: Current trends, shortcomings and considerations for future research. *Obesity Research & Clinical Practice* 17(6): 449–457. https://doi.org/10.1016/j.orcp.2023.09.010.

Gotera, W., Aristian, O., Nugraha, I. B. A., Suastika, K., Budhiarta, A. A. G., Saraswati, M. R., Dwipayana, I. M. P., & Semadi, I. M. S. (2024). Korelasi lemak viseral sebagai penanda obesitas sentral pada pemeriksaan body impedance analysis dengan serum profil lipid dan kadar gula puasa. *Udayana Journal of Internal Medicine*, 8(1), 1–6. https://doi.org/10.36216/jpd.v8i1.214.

Guglielmi, V., Dalle Grave, R., Leonetti, F., & Solini, A. (2024). Female obesity: clinical and psychological assessment toward the best treatment. *Frontiers in Endocrinology* 15:1349794. https://doi.org/10.3389/fendo.2024.1349794.

Hairunnisa, H. (2019). Sulitnya menemukan obat baru di Indonesia. *Farmasetika.com* 4(1):16–21. https://doi.org/10.24198/farmasetika.v4i1.22517.

Heymsfield, S. B., & Wadden, T. A. (2017). Mechanisms, pathophysiology, and management of obesity. *New England Journal of Medicine*, 376(3), 254–266. https://doi.org/10.1056/NEJMra1514009.

Husna, F., Suyatna, F. D., Arozal, W., & Purwaningsih, E. H. (2019). Model hewan coba pada penelitian diabetes. *Pharmaceutical Sciences and Research*, *6*(3), 131–141. https://doi.org/10.7454/psr.v6i3.4531.

IACUC: Anesthesia (Guideline). (2026). Vertebrate Animal Research - Office of the Vice President for Research | the University of Iowa. Retrieved April 13, 2026, from https://animal.research.uiowa.edu/iacuc-guidelines-anesthesia.

Kannan, S., & Bhaskaran, R. S. (2019). Sustained obesity reduces litter size by decreasing proteins regulating folliculogenesis and ovulation in rats – A cafeteria diet model. *Biochemical and Biophysical Research Communications*, 519(3), 475–480.

UNIVERSITAS
GADJAH MADA
Kajian Pendahuluan Induksi Obesitas pada Tikus Rattus norvegicus (Berkenhout, 1769) Betina Galur Wistar Menggunakan Cafeteria Diet
Rima Arvisya Natania Putri, Dr. Laksmindra Fitria, S.Si., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

https://doi.org/10.1016/j.bbrc.2019.09.025.

Kohn, D. F., & Clifford, C. B. (2007). Biology and diseases of rats. In J. G. Fox, L. C. Anderson, F. M. Loew, & F. W. Quimby (Eds.), *Laboratory animal medicine* (2nd ed., pp. 121–165). Academic Press. https://doi.org/10.1016/B978-0-12-263951-7/50007-7

Kolb, H. (2022). Obese Viseral fat tissue inflammation: from protective to detrimental? *BMC Medicine*, 20, 494. https://doi.org/10.1186/s12916-022-02672-y.

Koliaki, C., Spinos, T., Spinou, M., Brinia, M. E., Mitsopoulou, D., & Katsilambros, N. (2018). Defining the optimal dietary approach for safe, effective and sustainable weight loss in overweight and obese adults. *Healthcare (Basel)* 6(3): 73. https://doi.org/10.3390/healthcare6030073.

Kong, Y., Yang, H., Nie, R., Zhang, X., Zuo, F., Zhang, H., & Nian, X. (2025). Obesity: pathophysiology and therapeutic interventions. *Molecular Biomedicine* 6:25. https://doi.org/10.1186/s43556-025-00264-9.

La Russa, D., Giordano, F., Marrone, A., Parafati, M., Janda, E., & Pellegrino, D. (2019). Oxidative imbalance and kidney damage in cafeteria diet-induced rat model of metabolic syndrome: Effect of bergamot polyphenolic fraction. *Antioxidants*, *8*(3), 66. https://doi.org/10.3390/antiox8030066.

Lalanza, J.F. & Snoeren, E.M.S. 2021. The cafeteria diet: A standardized protocol and its effects on behavior. *Neuroscience and Biobehavioral Reviews* 122:92–119. https://doi.org/10.1016/j.neubiorev.2020.11.003.

Lazic, S. E., Semenova, E., & Williams, D. P. (2020). Determining organ weight toxicity with Bayesian causal models: Improving on the analysis of relative organ weights. *Scientific Reports*, 10, 6625. https://doi.org/10.1038/s41598-020-63496-6.

Lee, A. A., & Den Hartigh, L. J. (2025). Metabolic impact of endogenously produced estrogens by adipose tissue in females and males across the lifespan. *Frontiers in Endocrinology*, 16, 1682231. https://doi.org/10.3389/fendo.2025.1682231.

Lenert, M. E., & Burton, M. D. (2021). Acute effects of a high-fat diet on estrous cycling and body weight of intact female mice. *Neuropsychopharmacology, 47*(1), 418–419. https://doi.org/10.1038/s41386-021-01164-6.

Liu, C., Dou, Y., Zhang, M., Han, S., Hu, S., & Li, Y (2024). High-fat and high-sucrose diet impairs female reproduction by altering ovarian transcriptomic and metabolic signatures. *Journal of*

UNIVERSITAS
GADJAH MADA
Kajian Pendahuluan Induksi Obesitas pada Tikus Rattus norvegicus (Berkenhout, 1769) Betina Galur Wistar Menggunakan Cafeteria Diet
Rima Arvisya Natania Putri, Dr. Laksmindra Fitria, S.Si., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Translational Medicine, 22, 145. https://doi.org/10.1186/s12967-024-04952-y.

Lutz, T. A., & Woods, S. C. (2012). Overview of animal models of obesity. *Current Protocols in Pharmacology*, 58(1). https://doi.org/10.1002/0471141755.ph0561s58.

Macedo, I. C., de Freitas, J. S., & da Silva Torres, I. L. (2016). The influence of palatable diets in reward system activation: a mini review. *Advances in Pharmacological and Pharmaceutical Sciences*, 2016, 7238679. https://doi.org/10.1155/2016/7238679.

Malik, V. S., & Hu, F. B. 2019. Sugar-sweetened beverages and cardiometabolic health: An update of the evidence. *Nutrients*, 11(8), 1840. https://doi.org/10.3390/nu11081840.

Martire, S. I., Holmes, N., Westbrook, R. F., & Morris, M. J. (2019). Altered feeding patterns in rats exposed to a palatable cafeteria diet: increased snacking and its implications for development of obesity. *PLOS ONE*, 8(4), e60407. https://doi.org/10.1371/journal.pone.0060407.

Maynard, R. L. & Downes, N. (2019). Anatomy and Histology of the Laboratory Rat in Toxicology and Biomedical Research. Academic Press. 1-359.

Neeland, I.J., Lim, S., Tchernof, A., Gastaldelli, A., Rangaswami, J., Ndumele, C.E., Powell-Wiley, T.M., & Després, J.-P. (2024). Metabolic syndrome. *Nature Reviews Disease Primers* 10(1): 77. https://doi.org/10.1038/s41572-024-00563-5.

Nigro, N., Grossmann, M., Chiang, C., & Inder, W. J. (2017). Polyuria-polydipsia syndrome: A diagnostic challenge. *Internal Medicine Journal*, *48*(3), 244–253. https://doi.org/10.1111/imj.13627.

Orisaka, M., Miyazaki, Y., Shirafuji, A., & Tamamura, C. (2021). The role of pituitary gonadotropins and intraovarian regulators in follicle development: A mini-review. *Reproductive Medicine and Biology, 20*(2), 169–175. https://doi.org/10.1002/rmb2.12371.

Pan, A., & Hu, F. B. (2011). Effects of carbohydrates on satiety: differences between liquid and solid energy sources. *Current Opinion in Clinical Nutrition and Metabolic Care*, 14(4), 385–390. https://doi.org/10.1097/MCO.0b013e328346df36.

Pecoraro, N., Reyes, F., Gomez, F., Bhargava, A., & Dallman, M. F. (2014). Chronic stress promotes palatable feeding, which reduces signs of stress: feedforward and feedback effects of chronic stress. *Endocrinology*, 145(8), 3754–3762. https://doi.org/10.1210/en.2004-0305.

Purwaningsih, N. V., Maulidiyanti, E. T. S., Surohadi, N. D., Muzammil, A., Wijiastuti, B., & Fitriyah, L. (2025). Faktor pre-analitik

UNIVERSITAS
GADJAH MADA
Kajian Pendahuluan Induksi Obesitas pada Tikus Rattus norvegicus (Berkenhout, 1769) Betina Galur Wistar Menggunakan Cafeteria Diet
Rima Arvisya Natania Putri, Dr. Laksmindra Fitria, S.Si., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

pemeriksaan glukosa 2 jam PP pada pasien diabetes mellitus di RSU Haji Provinsi Jawa Timur Surabaya. *Jurnal Media Analis Kesehatan,* 16(1), 19–25. https://doi.org/10.32382/jmak.v16i1.1101.

Ramadhani, S.A., Supriatna, I., Karja, N.W.K., & Winarto, A. (2017). Pengendalian folikulogenesis ovarium dengan pemberian ekstrak biji kapas. *Jurnal Sain Veteriner* 35(1):71–79. https://doi.org/10.22146/jsv.29294.

Romieu, I., Dossus, L., Barquera, S., Blottière, H. M., Franks, P. W., Gunter, M., Hwalla, N., Hursting, S. D., Leitzmann, M., Margetts, B., Nishida, C., Potischman, N., Seidell, J., Stepien, M., Wang, Y., Westerterp, K., Winichagoon, P., Wiseman, M., & Willett, W. C. (2017). Energy balance and obesity: what are the main drivers? *Cancer Causes & Control, 28*(3), 247–258. https://doi.org/10.1007/s10552-017-0869-z.

Sampey, B. P., Vanhoose, A. M., Winfield, H. M., Freemerman, A. J., Muehlbauer, M. J., Fueger, P. T., Newgard, C. B., & Makowski, L. (2011). Cafeteria diet is a robust model of human metabolic syndrome with liver and adipose inflammation. *Obesity, 19*(6), 1109–1117. https://doi.org/10.1038/oby.2011.18.

Samuel, V. T., & Shulman, G. I. (2016). The pathogenesis of insulin resistance: integrating signaling pathways and substrate flux. *Journal of Clinical Investigation* 126(1): 12–22. https://doi.org/10.1172/JCI77812.

Schon, S. B., Cabre, H. E., & Redman, L. M. (2024). The impact of obesity on reproductive health and metabolism in reproductive-age females. *Fertility and Sterility, 122*(2), 194–203. https://doi.org/10.1016/j.fertnstert.2024.04.036.

Sclafani, A., & Ackroff, K. (2012). Role of gut nutrient sensing in stimulating appetite and conditioning food preferences. *American Journal of Physiology-Regulatory, Integrative and Comparative Physiology*, 302(10), R1119–R1133. https://doi.org/10.1152/ajpregu.00038.2012.

Silvestris, E., de Pergola, G., Rosania, R., & Loverro, G. 2018. Obesity as disruptor of the female fertility. *Reproductive Biology and Endocrinology*, 16:22. https://doi.org/10.1186/s12958-018-0336-z.

Skaznik-Wikiel, M. E., Swindle, D. C., Allshouse, A. A., Polotsky, A. J., & McManaman, J. L. (2016). High-fat diet causes subfertility and compromised ovarian function independent of obesity in mice. *Biology of Reproduction*, 94(5), 108. https://doi.org/10.1095/biolreprod.115.137414.

UNIVERSITAS
GADJAH MADA
Kajian Pendahuluan Induksi Obesitas pada Tikus Rattus norvegicus (Berkenhout, 1769) Betina Galur Wistar Menggunakan Cafeteria Diet
Rima Arvisya Natania Putri, Dr. Laksmindra Fitria, S.Si., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Speakman, J. R. (2019). Use of high-fat diets to study rodent obesity as a model of human obesity. *International Journal of Obesity* 43(8): 1491–1492. https://doi.org/10.1038/s41366-019-0363-7.

Sun, C., Yang, X., Wang, T., Cheng, M., & Han, Y. (2022). Ovarian biomechanics: From health to disease. *Frontiers in Oncology*, 11, 744257. https://doi.org/10.3389/fonc.2021.744257.

Szablewski, L. (2024). Changes in cells associated with insulin resistance. *International Journal of Molecular Sciences*, 25(4), 2397. https://doi.org/10.3390/ijms25042397.

Tang, J.-M., Wu, W.-B., Sun, X.-Q., Zhang, C.-C., & Mi, J.-X. (2013). Monitoring on some indicators of micro-environment inside the IVC cages. *Laboratory Animal and Comparative Medicine, 33*(6), 448–451. https://doi.org/10.3969/j.issn.1674-5817.2013.06.007

Volkow, N. D., Wise, R. A., & Baler, R. (2017). The dopamine motive system: implications for drug and food addiction. *Nature Reviews Neuroscience*, 18(12), 741–752. https://doi.org/10.1038/nrn.2017.130.

Wira, C.R., Rodriguez-Garcia, M., dan Patel, M.V. 2015. The role of sex hormones in immune protection of the female reproductive tract. *Nature Reviews Immunology* 15(4): 217–230. https://doi.org/10.1038/nri3819.

Wołodko, K., Castillo-Fernandez, J., Kelsey, G., & Galvão, A. (2021). Revisiting the impact of local leptin signaling in folliculogenesis and oocyte maturation in obese mothers. *International Journal of Molecular Sciences, 22*(8), 4270. https://doi.org/10.3390/ijms22084270

World Obesity Federation. 2025. World Obesity Atlas 2025. London: World Obesity Federation. https://data.worldobesity.org/publications/?cat=23.

Yao, X., Liu, W., Xie, Y., dan Xi, M. 2023. Fertility loss: negative effects of environmental toxicants on oogenesis. *Frontiers in Physiology* 14:1219045. https://doi.org/10.3389/fphys.2023.1219045.

Yang, P.-K., Chou, C.-H., Huang, C.-C., Wen, W.-F., Chen, H.-F., Shun, C.-T., Ho, H.-N., & Chen, M.-J. (2021). *Obesity alters ovarian folliculogenesis through disrupted angiogenesis from increased IL-10 production*. *Molecular Metabolism, 49*, 101189. https://doi.org/10.1016/j.molmet.2021.101189.

Yang, Y., Smith Jr., D.L., Keating, K.D., Allison, D.B., & Nagy, T.R. 2015. Variations in body weight, food intake and body composition after long-term high-fat diet feeding in C57BL/6J mice. *Obesity (Silver Spring)* 22(10):2147–2155.

UNIVERSITAS
GADJAH MADA
Kajian Pendahuluan Induksi Obesitas pada Tikus Rattus norvegicus (Berkenhout, 1769) Betina Galur Wistar Menggunakan Cafeteria Diet
Rima Arvisya Natania Putri, Dr. Laksmindra Fitria, S.Si., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

https://doi.org/10.1002/oby.20811.

Yong, W., Wang, J., Leng, Y., Li, L., & Wang, H. (2023). The role of obesity in female reproduction. *International Journal of Medical Sciences*, 20(3), 366–375. https://doi.org/10.7150/ijms.80189.

Zhang, H., Zhu, R., Sun, Q., & Du, L. (2025). Research progress on the role of FGF21 in insulin resistance. *Frontiers in Endocrinology*, 16, 1619462. https://doi.org/10.3389/fendo.2025.1619462.

Zhao, X., An, X., Yang, C., Sun, W., Ji, H., & Lian, F. (2023). The crucial role and mechanism of insulin resistance in metabolic disease. *Frontiers in Endocrinology* 14:1149239. https://doi.org/10.3389/fendo.2023.1149239.